Mitglied der Helmholtz-Gemeinschaft

JÜLICH
FORSCHUNGSZENTRUM

LARGE TAPE USERS GROUP

LTUG
Short introduction of JSC at FZJ

U.Schmidt

Forschungszentrum Jülich GmbH (FZJ)

One of the largest research centres in Europe

Jülich Supercomputing Centre (JSC)

Operates the central supercomputers, servers and campus-wide computer networks

Field: High Performance Computing

Members/Focus:

Stephan Graf – Open Systems

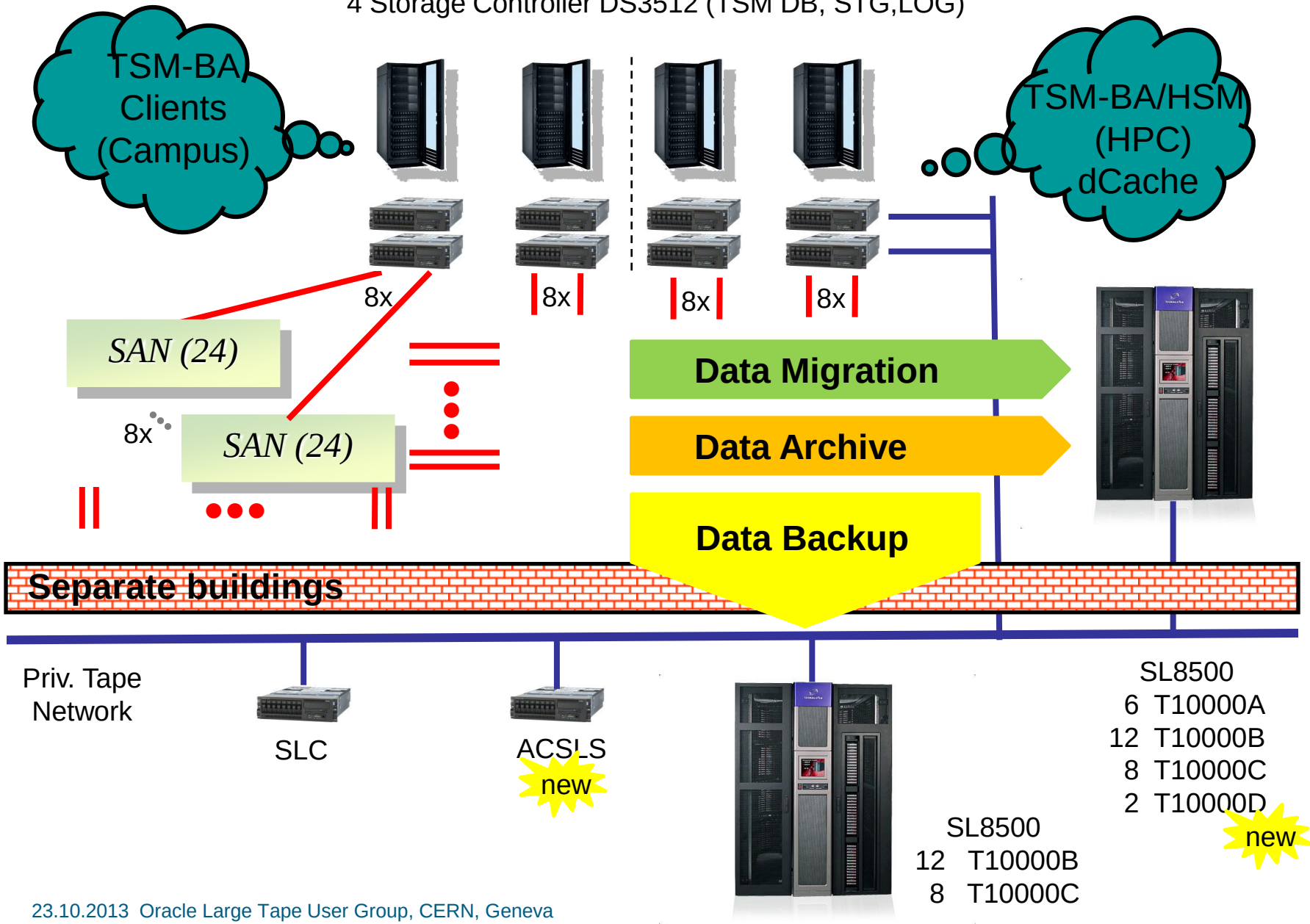
Ulrike Schmidt - Open Systems

Lothar Wollschläger - Open Systems

DATA CENTER

- Data Centers: **1**
- Open Systems Servers: **138**
  - GPFS Fileserver: 104 (20 + 28 NSD, 40 GSS, 2x8 TSM)
  - Lustre Fileserver: 34 (4 MDS, 30 OSS)
- CPU's (cores): **1324**
  - GPFS Fileserver: 1152 (160 + 224 NSD, 640 GSS, 2x64 TSM)
  - Lustre Fileserver: 172 (20 MDS, 152 OSS)
- Operating System Level: **RHEL 6.1/6.3/6.4** & **AIX 6.1**
  Linux SLES 11 SP1
- Tape Management System: **ACSLS**
- Amount of Disk: **16.4 PB** (GPFS 10.4 + 4.2 PB, Lustre 1.8 PB)
- Administrators for Disk: **5**
- Administrators for Tape: **3**

2x4 TSM Server IBM Power 720 (AIX,ACSLS,STLM)
4 Storage Controller DS3512 (TSM DB, STG,LOG)



SOFTWARE

- Tape Managenent System: **ACSLS 7.3.1 → 8.2.0** new
- Tape Monitoring System: **SDP**
- Shared Tape Library Manager: **TSM 6.2.4.0**
- Data Migration Product: **TSM-HSM 6.3.0.17**
- Data Backup Product: **TSM 6.2.4.0**
- Data Archive Product: **TSM 5.5.4.3**

ORACLE STORAGETEK HARDWARE

- Tape libraries: **2 x SL8500**
- Actual capacity: **44.5 PB**
- Maximum capacity: **83 PB** (Type C) / **132 PB** (Type D)

- #1 Capacity: **15.7 PB**
  - Cartridges: **6600** (4200 x 1 TB, 2300 x 5 TB)
  - Tape drives: **28** (6 x T10KA, 12 x T10KB, 8 x T10KC, 2 x T10KD) new
- #2 Capacity: **28.8 PB**
  - Cartridges: **10000** (5300 x 1 TB, 4700 x 5 TB)
  - Tape drives: **20** (12 x T10KB, 8 x T10KC)

PROJECTS SOLUTIONS COMMENTS (1)

- Projects with big scientific data
  - Human Brain Project
  - AMS Experiment at ISS
  - LOFAR / SKA Telescope

- Capacity planning
  - 2013: **2.7 PB/Q**
    (300 TB/mon * 3 copies * 3 month → 540 tapes/Q à 5 TB)
  - 2011/2012: **2.25 PB/Q**
    (250 TB/mon * 3 copies * 3 month → 450 tapes/Q à 5 TB)
  - 2010: **1 PB/Q**
    (100 TB/mon * 3 copies * 3 month → 1000 tapes/Q à 1 TB)

PROJECTS SOLUTIONS COMMENTS (2)

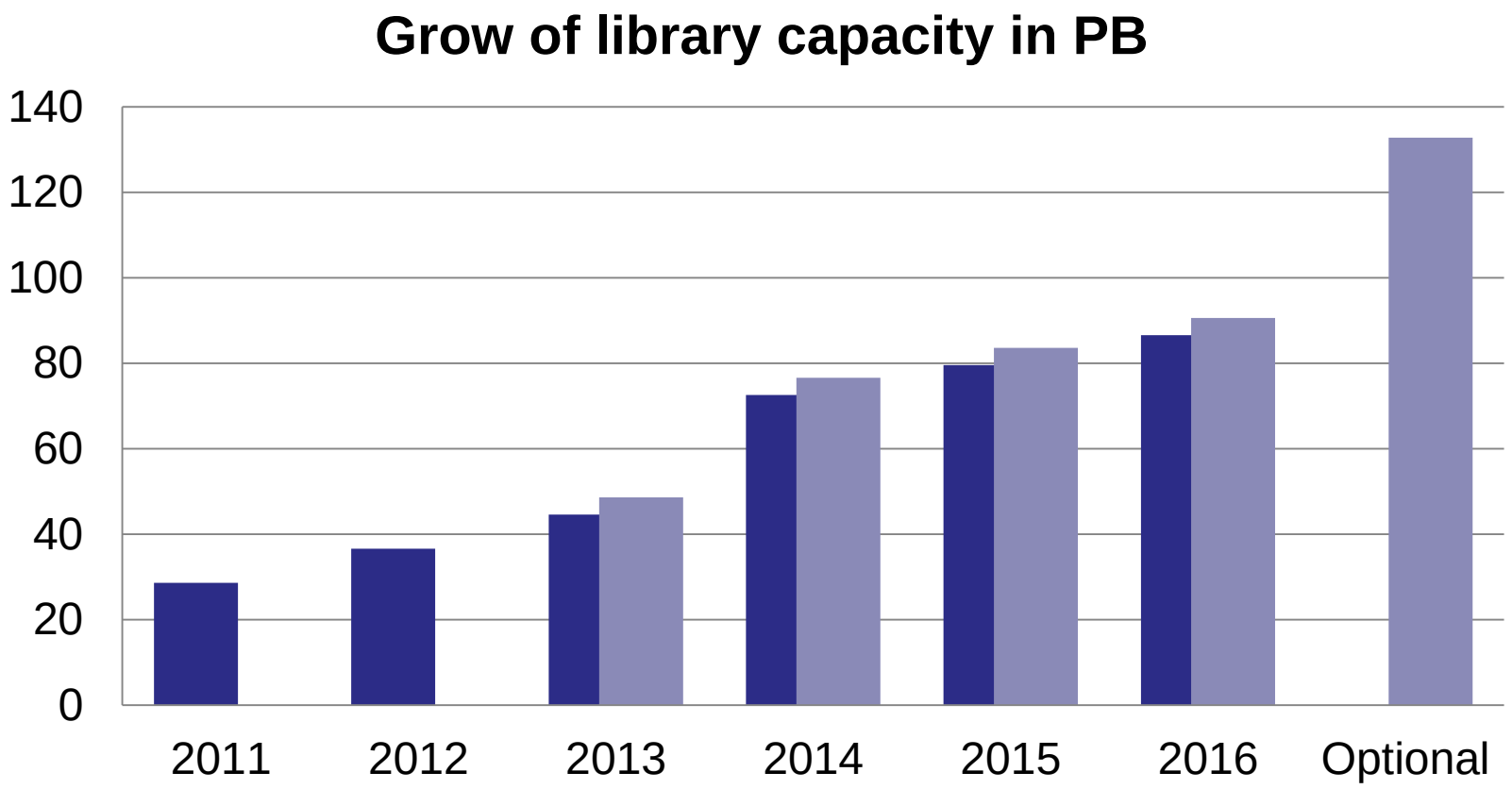
- March 2011: Signed Contract for Library Upgrade
  - Period: 2011-2016
  - Stepping up from 16 PB to 80 PB
  - Replace tape drives and cartridges by new technology
- Q4 2013: Need for additional increase of tape capacity
  - Replace 1000 cartridges more
- Q4 2013: Test T10KD tape drives with TSM
  - ACSLS Migration: 7.3.1 (AIX) → 8.2.0 (Solaris10)
  - SL8500 Microcode Upgrade: 6.07 → 8.05
  - Slot-License installation
  - TSM 6.3.4.200 + T10KD-Patch

PROJECTS SOLUTIONS COMMENTS (3)

Year	Library upgrade action	Capacity PB	
2011	add 16 x T10KC drives, replace 3000 tapes		28.6
2012	replace 2000 tapes		36.6
2013	replace 2000 tapes additional: replace 1000 tapes replace 2 x T10KA by T10KD	44.6	44.6 48.6
2014	add/replace T10KC by 32 x T10KD[1] replace 1000 tapes	72.6	76.6
2015	replace 1000 tapes	79.6	83.6
2016	replace 1000 tapes	86.6	90.6
Optional	replace 5600 tapes	132.8	132.8

[1] Assuming 8 TB with T10KD drives

PROJECTS SOLUTIONS COMMENTS (4)



PROJECTS SOLUTIONS COMMENTS (5)

What do we want from Oracle

- Need information about further product development
- Need roadmap for 5 years and later
- Need early discussions for strategic planning

What do we want from LTUG

- Share knowledge with similar users
- Learn from other installations
- Get information about future product development
- Get roadmap information for about 5 years

Thanks

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